

THE WEATHER OF THE MONTH.

By ALFRED J. HENRY, Chief of Division of Meteorological Records.

The month was generally free from severe storms and destructive cold waves. The temperature was abnormally high over substantially the whole country, and the rainfall was generally deficient, except on the Pacific coast from San Francisco northward and over Oklahoma and northern Texas.

The heavy rains in California, which State it may be remembered has but recently passed through several very dry years, will undoubtedly do much toward replenishing the diminished water supply.

Much thick weather with fog and rain prevailed on the Pacific coast north of central California.

In the Lake region the weather was especially fine and navigation was uninterrupted, except on lower Lake Michigan and then for a little more than twenty-four hours only.

PRESSURE.

The distribution of monthly mean pressure follows closely that of a normal winter month. Except in the Lake region and the upper Mississippi Valley, pressure was generally below normal, the greatest deficit being on the north Pacific coast. As compared with the preceding month mean pressure was markedly lower from the Ohio Valley and the Lake region to the Maritime Provinces of Canada and over the northern slope and the north Pacific coast. Between these two regions there was an increase of pressure amounting in the Rocky Mountain region to a tenth of an inch and over.

TEMPERATURE OF THE AIR.

The distribution of monthly mean surface temperature, as deduced from the records of about 1,000 stations, is shown on Chart VI.

Temperature was higher than usual over substantially the whole of the United States, the only region showing a deficit being a portion of northern New England. The excess ranged from about 2° on the Atlantic, Gulf, and Pacific coasts to 16° in Manitoba.

The line of freezing temperature extended from the Maryland coast southwesterly to the Rio Grande River in the neighborhood of Eagle Pass. The lowest temperatures of the month were recorded in western Kansas, western Nebraska, and western South Dakota. Abnormally high or low temperatures were not observed in any district.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
New England.....	10	41.1	0.0	+ 2.2	+ 0.2
Middle Atlantic.....	12	46.8	+ 1.6	+ 2.3	+ 0.2
South Atlantic.....	10	57.1	+ 2.2	+ 4.3	+ 0.4
Florida Peninsula.....	7	67.7	+ 1.0	+ 4.5	+ 0.4
East Gulf.....	7	60.5	+ 3.0	+ 1.3	+ 0.1
West Gulf.....	7	59.7	+ 3.2	+ 4.4	+ 0.4
Ohio Valley and Tennessee.....	12	49.5	+ 4.5	+ 8.8	+ 0.8
Lower Lake.....	8	42.6	+ 3.5	+ 9.9	+ 0.9
Upper Lake.....	9	41.4	+ 8.0	+ 7.0	+ 0.6
North Dakota.....	7	36.6	-12.7	- 5.9	- 0.5
Upper Mississippi.....	11	46.5	+ 9.1	+ 8.1	+ 0.7
Missouri Valley.....	10	46.5	+ 9.4	+ 5.4	+ 0.5
Northern Slope.....	7	40.9	+ 8.5	-15.5	- 1.5
Middle Slope.....	6	48.3	+ 6.8	+ 3.6	+ 0.3
Southern Slope.....	6	53.6	+ 4.7	0.0	0.0
Southern Plateau.....	13	49.9	+ 2.5	- 4.0	- 0.4
Middle Plateau.....	9	42.6	+ 4.5	- 9.8	- 0.9
Northern Plateau.....	10	43.4	+ 6.6	-10.3	- 0.9
North Pacific.....	9	51.2	+ 5.8	- 6.6	- 0.6
Middle Pacific.....	5	55.5	+ 1.9	- 3.0	- 0.3
South Pacific.....	4	58.7	+1.1	- 4.4	- 0.4

In Canada.—Prof. R. F. Stupart says:

The temperature was from average to 1° below in the Maritime Provinces, but elsewhere throughout Canada it was above average, and in nearly all localities to a large amount. This was strikingly the case in the Territories and in Manitoba, where the average was exceeded by from 15° to 20°. British Columbia and Ontario were also considerably in excess of the average.

PRECIPITATION.

As a whole the month was dry, especially on the Atlantic coast, in the Lake region, Ohio, West Virginia, eastern Tennessee, North Carolina, southern Georgia, and Florida. The districts wherein an excess of precipitation occurred were the middle and southern slopes, embracing Oklahoma, Indian Territory, and New Mexico, and part of Texas. Heavy rains also fell on the Pacific coast, from 20 to 30 inches being recorded at a number of places. In southern California barely the normal quantity of rain fell.

SNOWFALL.

The depth of snowfall during the month is graphically shown on Chart VIII, and the numerical values are given in Table II.

The snowfall of the month was generally light. A small area in central Illinois and northern Indiana received more than 10 inches, and falls of 10 inches and upward also occurred in the mountain regions of Colorado.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		Inches.	Inches.
New England.....	10	2.11	52	-1.9	- 5.5
Middle Atlantic.....	12	1.60	50	-1.6	- 3.9
South Atlantic.....	10	1.85	61	-1.2	- 5.8
Florida Peninsula.....	7	0.52	21	-2.0	- 2.0
East Gulf.....	7	2.59	70	-1.1	-11.7
West Gulf.....	7	2.63	67	-1.3	- 9.2
Ohio Valley and Tennessee.....	12	2.11	58	-1.5	- 6.1
Lower Lake.....	8	1.56	49	-1.6	- 7.6
Upper Lake.....	9	0.92	37	-1.6	- 4.4
North Dakota.....	7	0.37	55	-0.3	- 2.3
Upper Mississippi Valley.....	11	1.40	64	-0.8	- 0.7
Missouri Valley.....	10	0.89	64	-0.5	- 5.6
Northern Slope.....	7	0.42	81	-0.1	- 0.4
Middle Slope.....	6	1.68	214	+1.0	+ 3.9
Southern Slope.....	6	4.67	388	+3.6	+ 6.3
Southern Plateau.....	13	0.61	100	0.0	- 2.5
Middle Plateau.....	9	0.81	89	-0.1	+ 1.8
Northern Plateau.....	10	2.10	131	+0.5	+ 0.6
North Pacific.....	9	13.52	185	+6.2	+11.1
Middle Pacific.....	5	6.32	209	+3.3	+ 3.6
South Pacific.....	4	1.80	100	0.0	- 0.5

In Canada.—Professor Stupart says:

The rainfall over Vancouver Island and the lower mainland of British Columbia was excessive, and in that part of the Dominion it has been probably one of the wettest Novembers on record. Elsewhere throughout Canada precipitation was below average, except in small sections of the Northwest Territories and Manitoba, where it was very slightly above. The greatest amount below average was over the lower Lake region and the Georgian Bay district, Parry Sound reporting 3.0 inches below; Southampton, 2.7 inches below; Toronto, 2.0 inches below; and Kingston, 2.1 inches below. In the Province of Quebec the amount below average was about 1.5 inches, but in the Maritime Provinces the amount below average was generally quite small. A heavy fall of snow occurred over the Georgian Bay district on the 4th, and another one in the Maritime Provinces on the 12th, but the snow soon melted, and at the end of the month there was practically no snow on the ground in any portion of the Dominion.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 14. Arizona, 18. Arkansas, 18, 21, 26. Georgia,

13. Idaho, 10. Indiana, 22. Iowa, 6. Kansas, 21. Kentucky, 14. Maryland, 3. Missouri, 7, 8, 14, 17, 20, 21, 22. Nebraska, 30. New Mexico, 18. New York, 5, 12. Ohio, 16. Oklahoma, 17. Oregon, 10, 29. Pennsylvania, 3. Tennessee, 14. Texas, 18. Utah, 16. Washington, 21. Wisconsin, 10.

SLEET.

The following are the dates on which sleet fell in the respective States:

Arkansas, 2. Colorado, 10, 15, 19. Connecticut, 11. Idaho, 12, 29. Indiana, 2, 3, 29. Iowa, 11, 30. Maine, 4, 15, 22. Maryland, 3, 13, 14, 28. Massachusetts, 4, 11, 12, 15, 22. Michigan, 3, 13, 29, 30. Minnesota, 9, 10, 30. Mississippi, 3. Montana, 19, 27. Nebraska, 30. New Hampshire, 10, 11, 15, 21, 22. New Jersey, 14, 15. New Mexico, 15, 20. New York, 11, 14, 15, 21. North Dakota, 10, 12. Ohio, 2, 3, 4, 10, 23, 28. Oklahoma, 25. Pennsylvania, 3, 4, 11, 14, 15. Tennessee, 1, 2, 3, 7, 13. Texas, 1. Utah, 15, 17, 22, 30. Vermont, 11, 22. Washington, 16, 30. Wisconsin, 2, 10, 12, 22. Wyoming, 15, 19.

HUMIDITY.

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	76.4	-2	Missouri Valley	73.4	+2
Middle Atlantic	77	+1	Northern Slope	88	+2
South Atlantic	80	+1	Middle Slope	88	+4
Florida Peninsula	73	-3	Southern Slope	74	+13
East Gulf	72	-5	Southern Plateau	44	-12
West Gulf	75	+2	Middle Plateau	58	+2
Ohio Valley and Tennessee	75	+3	Northern Plateau	73	+2
Lower Lake	73	+3	North Pacific Coast	0	0
Upper Lake	83	+3	Middle Pacific Coast	25	+12
North Dakota	79	+0	South Pacific Coast	78	+11
Upper Mississippi	77	+3			

WIND.

The maximum wind velocity at each Weather Bureau station for a period of five minutes is given in Table I, which also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Carson City, Nev.	29	60	sw.	Fort Canby, Wash.	29	56	se.
Denver, Colo.	29	51	nw.	Do.	30	70	se.
Fort Canby, Wash.	10	62	se.	Havre, Mont.	28	52	sw.
Do.	13	54	se.	Mount Tamalpais, Cal.	21	53	w.
Do.	17	56	se.	Do.	29	56	w.
Do.	18	72	se.	New York, N. Y.	12	56	nw.
Do.	20	60	se.	Winnemucca, Nev.	29	75	w.
Do.	27	37	se.				

SUNSHINE AND CLOUDINESS.

The month was unusually free from clouds, except over the

Lake region, northern New England and the States of Idaho, Oregon, Washington, and northern California.

The distribution of sunshine is graphically shown on Chart VII, and the numerical values of average daylight cloudiness, both for individual stations and by geographical districts, appear in Table I.

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	5.9	+0.3	Missouri Valley	5.4	+0.5
Middle Atlantic	4.8	-0.4	Northern Slope	4.4	-0.2
South Atlantic	3.9	-0.6	Middle Slope	4.6	+1.0
Florida Peninsula	4.7	+0.1	Southern Slope	4.2	+1.0
East Gulf	4.6	+0.1	Southern Plateau	2.6	+0.3
West Gulf	4.6	0.0	Middle Plateau	4.9	+1.3
Ohio Valley and Tennessee	6.0	+0.3	Northern Plateau	7.0	+1.0
Lower Lake	7.6	+0.4	North Pacific Coast	8.7	+1.9
Upper Lake	6.9	-0.1	Middle Pacific Coast	7.0	+3.0
North Dakota	4.0	-1.3	South Pacific Coast	5.3	+2.4
Upper Mississippi	5.8	+0.5			

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table VII, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Reports of 661 thunderstorms were received during the current month as against 619 in 1898 and 732 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 14th, 111; 13th, 93; 21st, 61; 17th, 56.

Reports were most numerous from: Missouri, 123; Illinois, 86; Arkansas, 46; Kansas, 40.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, 12th to 20th.

The greatest number of reports were received for the following dates: 16th, 4; 2d, 25th, 29th, 2.

Reports were most numerous from: Ohio, 5; Montana and North Dakota, 3.

In Canada.—Auroras were reported as follows: Father Point, 3d, 6th, 23d, 29th, 30th; Minnedosa, 4th, 6th, 30th; Swift Current, 13th, 25th, 29th; Prince Albert, 4th, 25th, 27th; Battleford, 4th.

Thunderstorms were reported as follows: Yarmouth, 12th; Bermuda, 5th.

WEATHER IN THE WEST INDIES.

The distribution of pressure, temperature, and the direction of the resultant winds in the West Indies are shown on Chart IX. The numerical values of pressure, temperature, etc., for West Indian stations will be found in Tables I, II, III, IV, V, VI, VIII, IX, and X.

The climate and crop services of Cuba and Puerto Rico publish statistics of temperature and rainfall for a somewhat larger number of stations than is given at the end of Table II.

DESCRIPTION OF TABLES AND CHARTS.

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For description of tables and charts see page 424 of REVIEW for September, 1899.